AMENDMENTS TO THE CLAIMS

1.   **(Previously Presented)**   A method of determining and applying a heat treatment to a structural member so as to modify a deformation behavior of the structural member when subjected to an applied stress, said method comprising:

monitoring the structural member so as to generate monitored data;

simulating the deformation behavior of the structural member when subjected to the applied stress using the monitored data;

simulating the effect of at least one heat treatment upon at least a region of the structural member;

determining a suitable heat treatment to apply to at least the region of the structural member to produce a modified deformation behavior; and

applying the suitable heat treatment to the structural member.

2.   **(Previously Presented)**   The method according to claim 1, wherein said simulating of the deformation behavior uses a numerical modelling method.

3.   **(Previously Presented)**   The method according to claim 1, wherein said simulating of the effect of at least one heat treatment uses a numerical modelling method.

4.   **(Previously Presented)**   The method according to claim 2, wherein the numerical modelling method comprises a finite elements method.

5.   **(Previously Presented)**   The method according to claim 1, wherein said simulating of the effect of at least one heat treatment uses a localized heat source.

6.   **(Previously Presented)**   The method according to claim 1, wherein said simulating of the effect of at least one heat treatment comprises uses a moveable heat source.

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7. **(Previously Presented)** The method according to claim 1, wherein said determining of the suitable heat treatment comprises determining the suitable heat treatment such that a temperature of the structural member during said applying of the suitable heat treatment is less than a melting temperature of the structural member.

8. **(Previously Presented)** The method according to claim 1, wherein said simulating of the effect of at least one heat treatment comprises simulating the effect of a plurality of heat treatments by varying a heat treatment parameter to simulate the effect of the number heat treatments.

9. **(Previously Presented)** The method according to claim 8, wherein the heat treatment parameter is a travel speed of a heat source, a heat input of the heat source, a heat intensity distribution of the heat source, or a maximum temperature of the heat source.

10. **(Previously Presented)** The method according to claim 1, wherein said determining of the suitable heat treatment comprises determining the suitable heat treatment automatically.

11. **(Previously Presented)** The method according to claim 1, further comprising selecting one or more regions of the structural member in accordance with said simulating of the deformation behavior.

12. **(Previously Presented)** The method according to claim 11, wherein said selecting of the one or more regions comprises selecting the one or more regions in accordance with a deformation property.

13. **(Previously Presented)** The method according to claim 12, wherein the deformation property is ductility, stress, strain, elongation, or a fracture property.

14.   (Previously Presented)   The method according to claim 12 wherein said selecting of the one or more regions comprises selecting the one or more regions in accordance with a threshold of the deformation property.

15.   (Previously Presented)   The method according to claim 12, further comprising assigning a target threshold to the deformation property for each region.

16.   (Previously Presented)   The method according to claim 15, wherein said simulating of the deformation behavior of the structural member comprises repeatedly:

   simulating the deformation behavior of the structural member in accordance with the assigned target threshold in each region;

   comparing the simulated deformation behavior with a desired deformation behavior; and

   assigning a new target threshold and/or selecting one or more new regions, until the simulated deformation behavior is the desired deformation behavior.

17.   (Previously Presented)   The method according to claim 15, wherein the said determining of the suitable heat treatment comprises determining a heat treatment which produces a deformation behavior meeting the target threshold in each region.

18.   (Currently Amended)   The method according to claim 17, wherein said simulating of the deformation behavior of the structural member comprises repeatedly:

   simulating the deformation behavior of the structural member in accordance with the assigned target threshold in each region;

   comparing the simulated deformation with a desired deformation behavior; and

   assigning a new target threshold and/or selecting one or more new regions, until the~~,~~ ~~simulated~~ the simulated deformation behavior is the desired deformation behavior, the desired deformation behavior being the deformation behavior meeting the target threshold in each region.

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19. **(Previously Presented)** The method according to claim 11, wherein said selecting the one or more regions comprises automatically selecting the one or more regions.

20. **(Previously Presented)** The method according to claim 11, wherein said simulating of the deformation behavior of the structural member comprises simulating the deformation behavior of the structural member in a heat treated condition.

21. **(Previously Presented)** The method according to claim 20, further comprising selecting one or more additional regions for subsequent heat treatment in accordance with said simulating of the deformation behavior of the structural member in the heat treated condition.

Claim 22 (Cancelled).

23. **(Previously Presented)** The method according to claim 1, wherein said applying of the suitable heat treatment comprises utilizing a localized, controllable heat source.

24. **(Previously Presented)** The method according to claim 23, wherein said applying of the suitable heat treatment comprises utilizing a laser or induction coils.

Claim 25 (Cancelled).

26. **(Previously Presented)** The method according to claim 1, wherein said determining the suitable heat treatment comprises selecting a heat treatment for the at least one region of the structural member from a group of predetermined heat treatments for the structural member.

27. **(Previously Presented)** The method according to claim 1, wherein said applying of the suitable heat treatment comprises applying the suitable heat treatment to a structural member

including at least two substructural members welded together.

28.   (Previously Presented)   The method according to claim 1, wherein said applying of the suitable heat treatment comprises applying the suitable heat treatment to a vehicle impact member.

Claims 29 – 43 (Cancelled).